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ART UNIT	PAPER NUMBER
	1107

DATE MAILED:

02/16/90

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents

Office Action SummaryApplication No.
08/393,677Applicant(s)
Kira et al.Examiner
David E. GraybillGroup Art Unit
1107☒ Responsive to communication(s) filed on 24 Oct 1995☐ This action is **FINAL**.☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims☒ Claim(s) 1-10 is/are pending in the application.Of the above, claim(s) 9 and 10 is/are withdrawn from consideration.☐ Claim(s) _____ is/are allowed.☒ Claim(s) 1-8 is/are rejected.☐ Claim(s) _____ is/are objected to.☐ Claims _____ are subject to restriction or election requirement.**Application Papers**☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.☐ The drawing(s) filed on _____ is/are objected to by the Examiner.☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.☒ The specification is objected to by the Examiner.☐ The oath or declaration is objected to by the Examiner.**Priority under 35 U.S.C. § 119**☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been☒ received.☐ received in Application No. (Series Code/Serial Number) _____☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).**Attachment(s)**☒ Notice of References Cited, PTO-892☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____☐ Interview Summary, PTO-413☐ Notice of Draftsperson's Patent Drawing Review, PTO-948☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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Applicant's election without traverse of group I, claims 1-8, in paper no. 7 is acknowledged.

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to provide an adequate written description of the invention, and failing to provide an enabling disclosure.

In particular, at page 5, lines 31-37, applicant teaches that the first pressure lower than the second pressure enables, "a dispersion of a degree of collapse of the projection electrodes [to be] absorbed." Although this teaching is idiomatically obscure, it appears to suggest that the first pressure lower than the second pressure enables uniform electrode deformation. Yet, the causal relation between the particular relative pressures and the uniformity of electrode deformation is inadequately described; hence, the relation is unclear.

Also, at page 9, lines 5-9, the idiomatic and art non-recognized term "half-thermosetting" is defined as, "reducing a degree of viscosity and thixotropy." However, the meaning of the term *thixotropy* is unclear because it appears to be given a

meaning repugnant to the usual meaning of the term; the usual meaning being, the property of certain gels of becoming fluid on agitation and coagulating again when at rest (as, a suspension of ferrous hydroxide). As a result, the meaning of the term *half-thermosetting* is also unclear.

In addition, at page 11, lines 10-14, applicant teaches that in the claimed process, the chip, "is fixed in the first fixing by the pressing only...In such way, [sic] the first fixing for the precise alignment is performed in a different process from the pressing and heating." Yet, in apparent contradiction, at page 9, lines 13-18, applicant teaches that in the claimed process, the first fixing is performed in the same process as the heating on the heat plate 39.

Further, at page 11, lines 22-28, applicant teaches an improvement over the prior art process, "[in the instant invention] several processes, such as pressing, heating, and aligning, may be performed by a single process." Yet, this teaching appears to contradict the teaching at page 2, lines 23-27, and repeated elsewhere in the specification, "[in the conventional process] the alignment, the heating, and the pressing are simultaneously performed."

Claims 1-8 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification and directed to the term *half-thermosetting*.

Claims 1-8 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 5 the phrase "given number" is indefinite because the term "given" merely means *specified beforehand*, and as such, it does not limit the scope of the claims. If applicant intends to patent detailed controls over the process, such controls should be recited in the claims. Furthermore, it is unclear if the scope of the phrase *given number* encompasses a single chip.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

Claims 1, 2 and 5-8 are rejected under 35 U.S.C. § 103 as being unpatentable over the combination of applicant's admitted prior art and Maeda '486.

Applicant teaches a process comprising the steps of forming leveled projection electrode studs 14 on a semiconductor chip 11 by wire-bonding; forming conductive adhesive 16a on the studs by a conductive adhesive 16 that has been skidded on a plate 15a and then transcribed onto the studs; applying a thermosetting insulating adhesive 18 to mounting parts of a substrate 17; aligning the chip to the mounting parts; heating the substrate; and performing a fixing of the semiconductor with a final pressure and a thermosetting temperature of the adhesive; see page 1, line 23 to page 2, line 22.

However, applicant does not teach a process comprising the steps of heating the adhesive on the substrate with a half-thermosetting temperature, and performing a first fixing of the chips with a first pressure in addition to the final fixing step. Nonetheless, at column 1, lines 7-13 and 46-59; column 3, lines 48-67; column 4, lines 13-55; and column 5, lines 19-47, Maeda teaches such a process. Moreover, it would have been obvious to combine the process of Maeda with the process of applicant's admitted prior art because it would enable accurate alignment before the final pressing and fixing step of applicant's admitted

prior art. Furthermore, although Maeda does not explicitly teach a second fixing pressure higher than the first pressure it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose the particular relative fixing pressures because applicant has not disclosed that the pressures solve any unobvious problem or are for any particular unobvious purpose, and it appears prima facie that the process would possess utility using other relative pressures.

Claims 3 and 4 are rejected under 35 U.S.C. § 103 as being unpatentable over the combination of applicant's admitted prior art and Maeda as applied to claims 1, 2 and 5-8 supra, and further in combination with Fujimoto.

The combination of applicant's admitted prior art and Maeda does not explicitly teach a process comprising the step of simultaneously fixing each chip with the second pressure. Nevertheless, at column 5, lines 57-63, Fujimoto teaches such a process. In addition, it would have been obvious to combine the process of Fujimoto with the process of the combination of Maeda and applicant's admitted prior art because it would reduce production time.

The prior art made of record and not relied on is considered pertinent to applicant's disclosure. It is cited primarily to show processes of manufacturing a semiconductor package similar to the process of the instant claimed invention. In particular,

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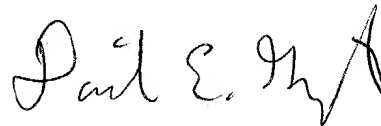
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Akiguchi '642 explicitly teaches a process of thermo-curing a thermosetting adhesive by exposure to ultraviolet light.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday; 8:30 am to 6:00 pm.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist at (703) 308-0661.

The fax phone number for group 2900 is (703) 305-3599.



David E. Graybill
Patent Examiner
Art Unit 1107

D.G.
9 February 1996